SI2333DS-T1-E3 Datasheet

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DiGi Electronics Part Number	SI2333DS-T1-E3-DG
Manufacturer	Vishay Siliconix
Manufacturer Product Number	SI2333DS-T1-E3
Description	MOSFET P-CH 12V 4.1A SOT23-3
Detailed Description	P-Channel 12 V 4.1A (Ta) 750mW (Ta) Surface Mount SOT-23-3 (TO-236)

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RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
SI2333DS-T1-E3	Vishay Siliconix
Series:	Product Status:
TrenchFET®	Active
FET Type:	Technology:
P-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
12 V	4.1A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.8V, 4.5V	32mOhm @ 5.3A, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
1V @ 250μA	18 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±8V	1100 pF @ 6 V
FET Feature:	Power Dissipation (Max):
-	750mW (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
SOT-23-3 (TO-236)	TO-236-3, SC-59, SOT-23-3
Base Product Number:	
SI2333	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

Si2333DS

Vishay Siliconix

P-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 12	0.032 at V_{GS} = - 4.5 V	- 5.3
	0.042 at V_{GS} = - 2.5 V	- 4.6
	0.059 at V_{GS} = - 1.8 V	- 3.9

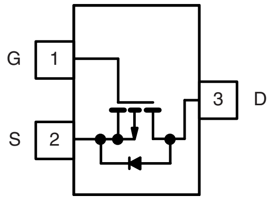
FEATURES

- **Halogen-free According to IEC 61249-2-21 Available**
- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch
- PA Switch

TO-236
(SOT-23)



Top View

Si2333DS (E3)*

* Marking Code

Ordering Information: Si2333DS-T1-E3 (Lead (Pb)-free)
Si2333DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter		Symbol	5 s	Steady State	Unit
Drain-Source Voltage		V_{DS}	- 12		V
Gate-Source Voltage		V_{GS}	± 8		
Continuous Drain Current (T_J = 150 °C)[a, b]	T_A = 25 °C	I_D	- 5.3	- 4.1	A
	T_A = 70 °C		- 4.2	- 3.3	
Pulsed Drain Current		I_{DM}	- 20		
Continuous Source Current (Diode Conduction)[a, b]		I_S	- 1.0	- 0.6	
Maximum Power Dissipation[a, b]	T_A = 25 °C	P_D	1.25	0.75	W
	T_A = 70 °C		0.8	0.48	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 5 s	R_{thJA}	75	100	°C/W
	Steady State		120	166	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40	50	

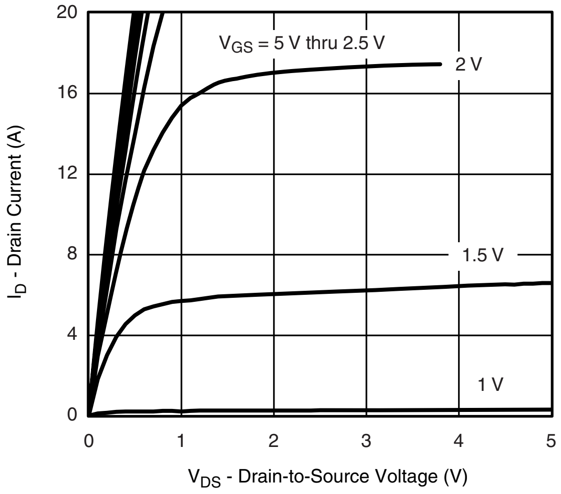
Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. Pulse width limited by maximum junction temperature.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted

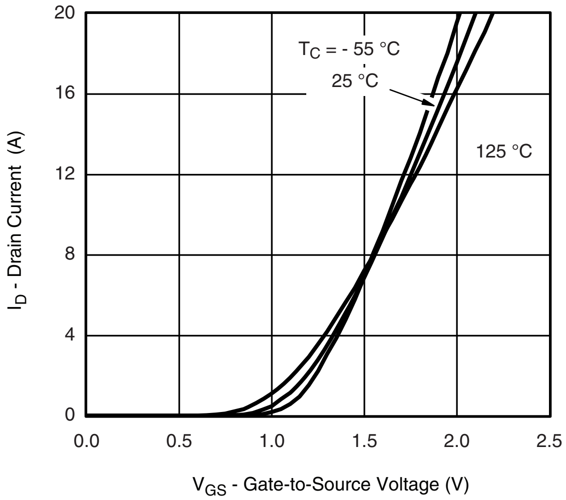
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = - 250 µA	- 12			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = - 250 µA	- 0.40		- 1.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 9.6 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 9.6 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 4.5 V	- 20			A
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 5.3 A		0.025	0.032	Ω
		V_{GS} = - 2.5 V, I_D = - 4.6 A		0.033	0.042	
		V_{GS} = - 1.8 V, I_D = - 2.0 A		0.046	0.059	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 5.3 A		17		S
Diode Forward Voltage	V_{SD}	I_S = - 1.0 A, V_{GS} = 0 V		- 0.7	- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 6 V, V_{GS} = - 4.5 V $I_D \cong$ - 5.3 A		11.5	18	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			3.2		
Input Capacitance	C_{iss}	V_{DS} = - 6 V, V_{GS} = 0 V, f = 1 MHz		1100		pF
Output Capacitance	C_{oss}			390		
Reverse Transfer Capacitance	C_{rss}			300		
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = - 6 V, R_L = 6 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 4.5 V R_G = 6 Ω		25	40	ns
	t_r			45	70	
Turn-Off Time	$t_{d(off)}$			72	110	
	t_f			60	90	

Notes:
a. Pulse test: PW ≤ 300 µs, duty cycle ≤ 2 %.
b. For design aid only, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

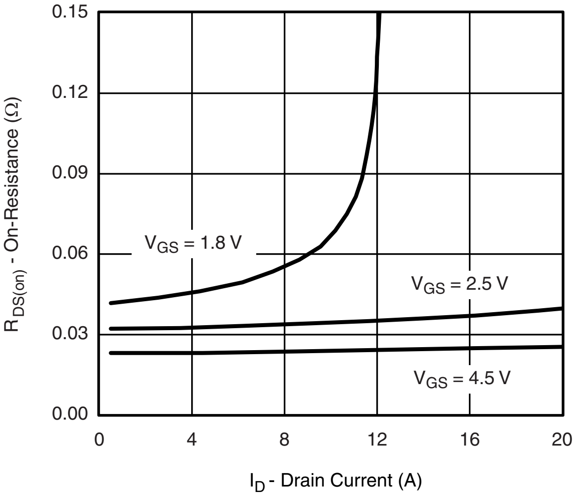
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



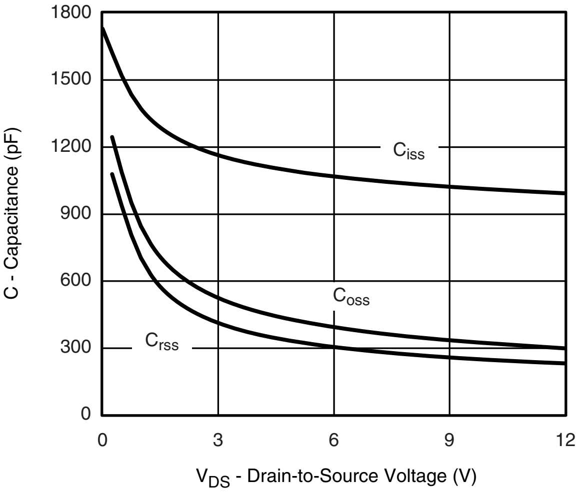
Output Characteristics



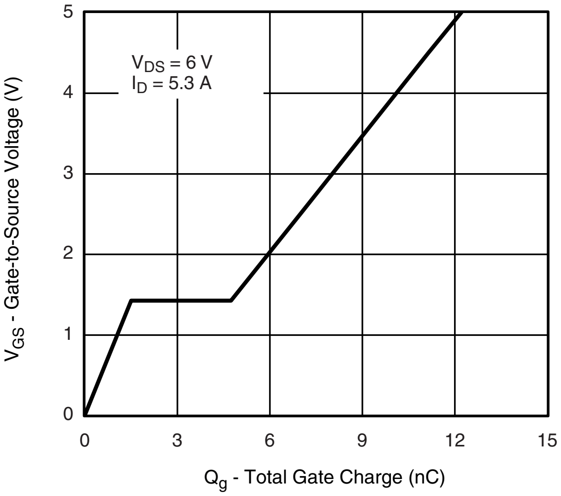
Transfer Characteristics



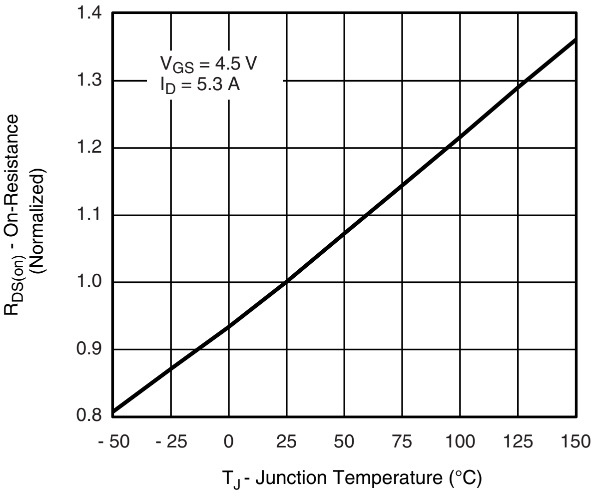
On-Resistance vs. Drain Current



Capacitance

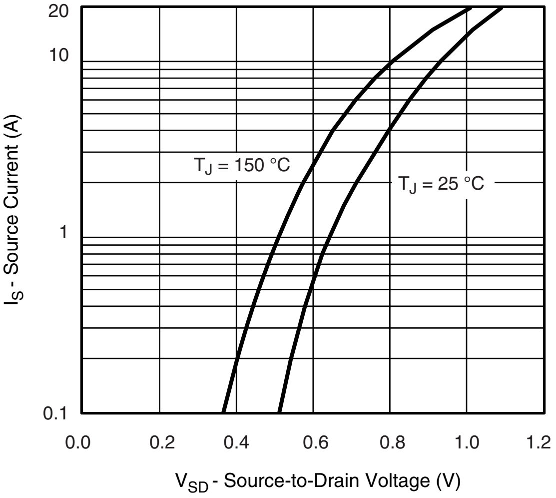


Gate Charge

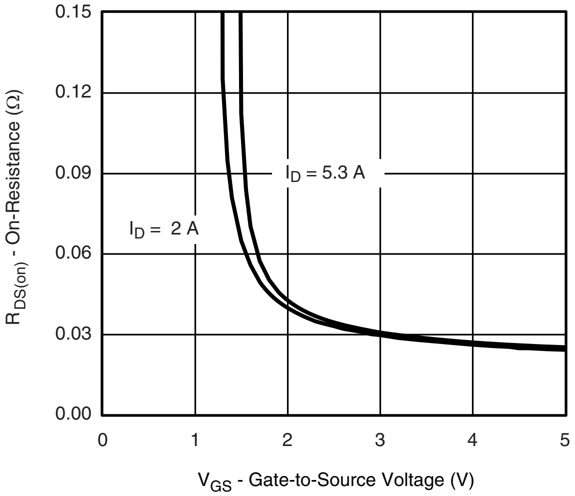


On-Resistance vs. Junction Temperature

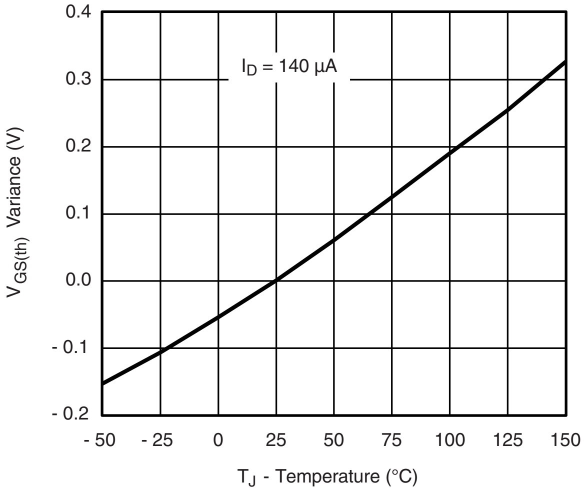
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



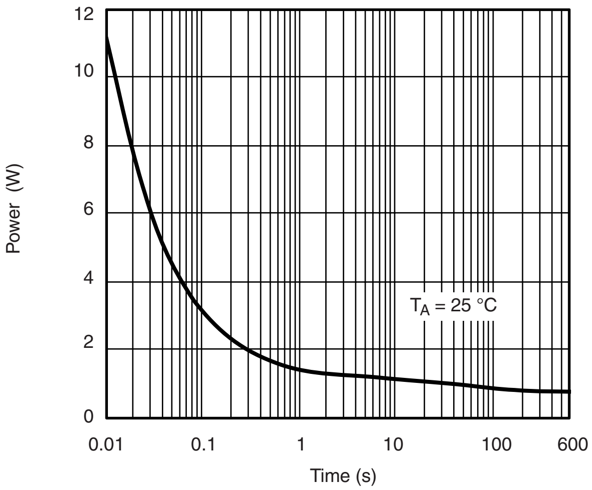
Source-Drain Diode Forward Voltage



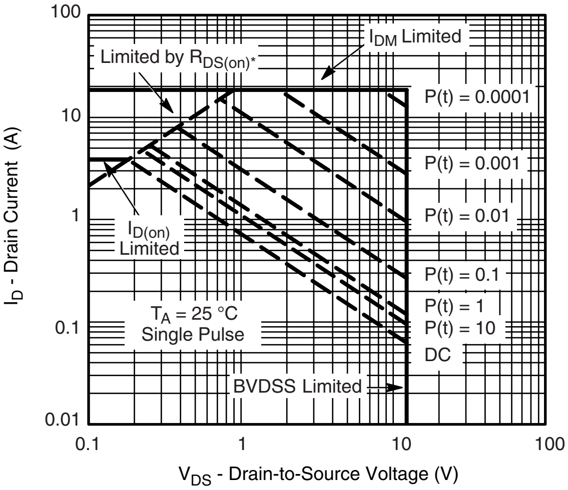
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



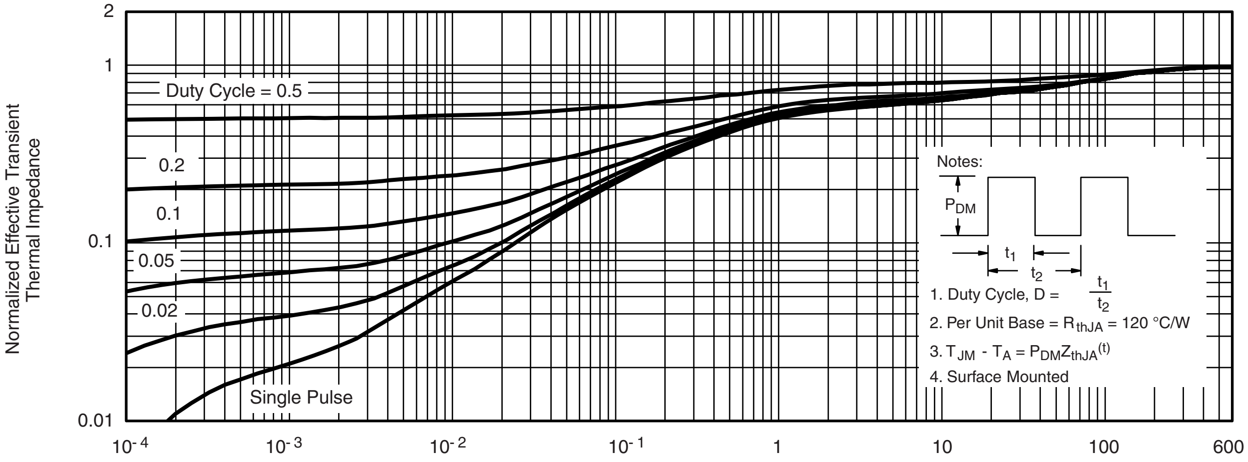
Single Pulse Power



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient

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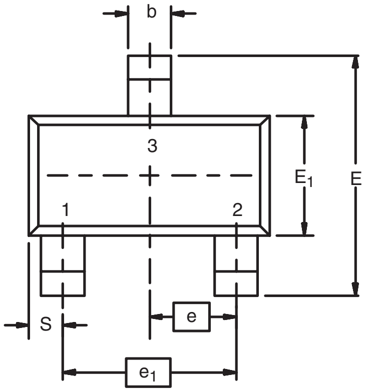
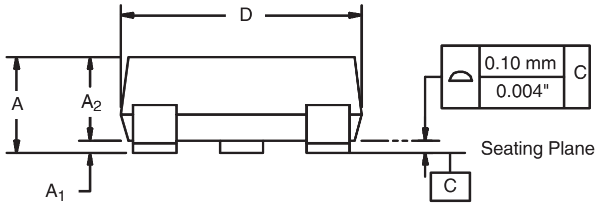
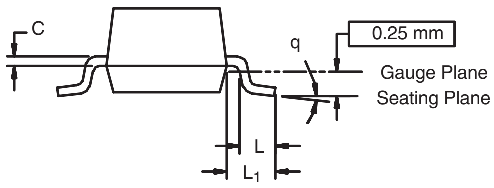
SOT-23 (TO-236): 3-LEAD

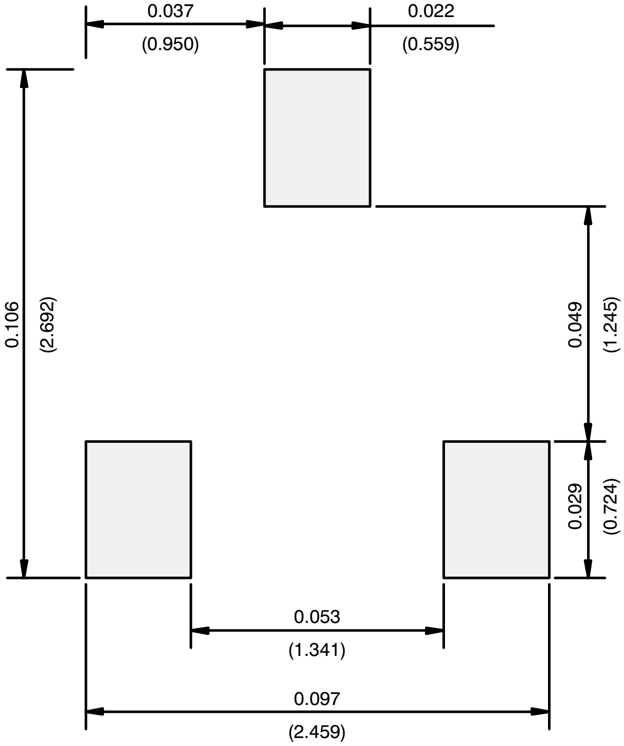






Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A_1	0.01	0.10	0.0004	0.004
A_2	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E_1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e_1	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L_1	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°
ECN: S-03946-Rev. K, 09-Jul-01 DWG: 5479				

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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